



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,068	12/20/2001	Keith Malang	3123-396	2899

32093 7590 04/10/2003

HANSRA PATENT SERVICES
4525 GLEN MEADOWS PLACE
BELLINGHAM, WA 98226

EXAMINER

LAIR, DONALD M

ART UNIT	PAPER NUMBER
----------	--------------

2858

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,068

Applicant(s)

MALANG ET AL.

Examiner

Donald M. Lair

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7-20 and 23 is/are rejected.
- 7) ☒ Claim(s) 4, 6, 21, and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION*Drawings*

1. This application, filed under former 37 CFR 1.60, lacks formal drawings. The informal drawings filed in this application are acceptable for examination purposes. When the application is allowed, applicant will be required to submit new formal drawings. In unusual circumstances, the formal drawings from the abandoned parent application may be transferred by the grant of a petition under 37 CFR 1.182.

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 23 recites the limitation "... said expected capacitance" in line 1. There is insufficient antecedent basis for this limitation in the claim, since Claim 19 makes no reference to an "expected capacitance."

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 – 3, 5, and 7 – 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Susz (US-4,514,773).

7. In regards to Claim 1, Susz teaches a method for calibrating a driver, comprising determining a measured capacitance associated with at least one piezoelectric element prior to positioning the piezoelectric element over a disk surface, and adjusting the driver based on the determining step (Column 4, line 61 – Column 5, line 16).

8. In regards to Claim 2, Susz teaches a method for calibrating a driver including all the steps disclosed above, further comprising determining a second measured capacitance associated with the at least one piezoelectric element after a predetermined time period following the adjusting step, and adjusting the driver based on the determining step (Column 4, line 61 – Column 5, line 16), wherein it is inherent that the steps of Claim 1 will be repeated due to the existence of multiple piezoelectric elements (Column 3, lines 36 – 40).

9. In regards to Claim 3, Susz teaches a method for calibrating a driver including all the steps disclosed above, wherein the determining step comprises driving the at least one piezoelectric element to a predetermined starting voltage, supplying a predetermined current to the at least one piezoelectric element for a predetermined time period, measuring a second voltage associated with the at least one piezoelectric element after the supplying step, and calculating the measure capacitance based on the measuring step (Column 5, lines 5 – 16).

10. In regards to Claim 5, Susz teaches a method for calibrating a driver including all the steps disclosed above, wherein the step of determining comprises driving the at least one piezoelectric element with a predetermined starting voltage, supplying a predetermined current to the actuator element (Column 5, lines 5 – 16), starting a timer (Column 5, lines 50 – 52),

Art Unit: 2858

monitoring a voltage associated with the at least one piezoelectric element, stopping the timer to get an elapsed time when the voltage reaches a predetermined voltage level in the monitoring step and calculating the measure capacitance based on the elapsed time (Column 5, lines 5 – 52).

11. In regards to Claim 7, Susz teaches a method for calibrating a driver including all the steps disclosed above, wherein the adjusting step includes determining a difference between the measured capacitance and an expected capacitance and adjusting a gain associated with the driver based on the determining step (Column 5, lines 25 – 29), wherein it is inherent that since Susz is treating the piezoelectric devices as capacitances the positional error will be determined by a capacitance difference.

12. In regards to Claims 8 and 9, Susz teaches a method for calibrating a driver including all the steps disclosed above, wherein there is a voltage controlled driver and a charge control driver (Column 1, lines 43 – 49; Column 7, lines 45 – 52).

13. In regards to Claim 10, Susz discloses a hard disk drive comprising at least one disk rotatable about an axis, an actuator assembly moveable relative to the disk, a transducer positioned on the actuator assembly, a piezoelectric element disposed on the actuator assembly and operable to move at least the transducer relative to the surface of the disk (Column 1, lines 7 – 20), a calibration circuit operable for determining a capacitance associated with the piezoelectric element, and a piezoelectric power supply operable for supplying power to the piezoelectric element based on the capacitance associated with the piezoelectric element (Column 4, line 61 – Column 5, line 16).

Art Unit: 2858

14. In regards to Claims 11 and 12, Susz discloses a device comprising all the elements described above, wherein the piezoelectric element comprises at least two piezoelectric crystals (Column 4, line 64 – Column 5, line 3).

15. In regards to Claim 13, Susz discloses a device comprising all the elements described above, wherein the calibration circuit is operable to deliver a constant current to the piezoelectric element (Column 2, lines 37 – 39).

16. In regards to Claim 14, Susz discloses a device comprising all the elements described above, further comprising a mode switch operable to connect the piezoelectric element to either the piezoelectric power supply or the calibration circuit (Column 1, lines 21 – 49; Column 4, line 61 – Column 5, line 16).

17. In regards to Claims 15 and 16, Susz discloses a device comprising all the elements described above, wherein the piezoelectric power supply includes a charge control driver operable to deliver charge to the piezoelectric device and to remove charge from the piezoelectric device, and a dynamic range adjustment portion operable to adjust a dynamic range of the charge control driver (Column 7, lines 45 – 52).

18. In regards to Claims 17 and 18, Susz discloses a device comprising all the elements described above, further comprising a voltage control driver operable to control a voltage across the piezoelectric element, and a gain adjustment portion operable to adjust a voltage gain associated with the voltage control driver, based on the capacitance associated with the piezoelectric element (Column 5, lines 25 – 38).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 19 – 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susz.

21. In regards to Claim 19, Susz discloses a method and device comprising all the elements described above; however, the reference fails to explicitly teach ascertaining the number of piezoelectric devices contained within the device.

22. On Page 4, lines 7 – 14 of the applicant's specification, the applicant discloses that a disadvantage of the well-known system of a charge control driver is that it is dependant on the number of piezoelectric elements being driven.

23. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method for driving the actuators disclosed by Susz to include the step of ascertaining the number of piezoelectric devices contained within the device for the purpose of enabling the device to modify its operation due to the number of piezoelectric devices since the operation of the driving circuitry depends on that number.

24. In regards to Claim 20, Susz teaches a method for calibrating a driver including all the steps disclosed above, wherein the determining step comprises driving the at least one piezoelectric element to a predetermined starting voltage, supplying a predetermined current to the at least one piezoelectric element for a predetermined time period, measuring a second

Art Unit: 2858

voltage associated with the at least one piezoelectric element after the supplying step, and calculating the measure capacitance based on the measuring step (Column 5, lines 5 – 16).

Allowable Subject Matter

25. Claims 4, 6, 21, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

26. The following is a statement of reasons for the indication of allowable subject matter: The calculating step, explicitly including the equation recited in Claims 4, 6, and 21 is not taught by the prior art of record.

Art Unit: 2858


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald M. Lair whose telephone number is (703) 305-4450. The examiner can normally be reached on Monday - Friday, 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1436.


Donald M. Lair
Patent Examiner
Art Unit 2858
April 4, 2003


N. Le
Supervisory Patent Examiner
Technology Center 2800